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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/811,071	03/16/2001	William A. Honjas	677.478	6303

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EXAMINER	
SHARON, AYAL I	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 07/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/811,071	HONJAS ET AL.	
	Examiner	Art Unit	
	Ayal I Sharon	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-94* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-94* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/16/01,8/14/01,1/*
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. Claims 1-94 of U.S. Application 09/811,071 filed on 03/16/2001 are presented for examination. The application claims priority to provisional application 60/190,316, filed on 03/17/2000.

Claim Interpretations

2. In regards to Claims 1, 27, 41-46, 60, 71-75, and 87, Examiner interprets "distal" as corresponding to "Anatomically located far from a point of reference, such as an origin or a point of attachment", the definition in The American Heritage® Dictionary of the English Language, Fourth Edition Copyright © 2000 by Houghton Mifflin Company.
3. In regards to Claims 10-18, 25, 38, 47, 59, and 68, Examiner interprets "parallelizable", which was not found in the American Heritage Dictionary, as corresponding to "can be parallelized", i.e. "can be rendered parallel".
4. In regards to Claims 27 and 46, Examiner interprets "selectably connected to" ("selectably" was not found in the American Heritage Dictionary), as corresponding to "is selected to be connected to".

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claim 93 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claim is non-statutory because it is not exclusively directed to the technological arts. It is possible to charge a user a fee for services by many different means: in a conversation, in a hand written notice, etc.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 93 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is not clear how the method "includes the step of charging the user a fee for services".

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 60 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 60 recites the limitations "displaying steps D and G" and "providing step F". There is insufficient antecedent basis for the steps cited in the limitations.

11. Claims 1-2, 5-7, 10-18, 25, 27, 30, 38, 47, 51, 59, 64, and 68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims contain the phrase "may", which renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). All dependent claims inherit this defect, therefore, the full list of rejected claims is: Claims 1-25, 27-34, 37-43, 47-53, 57, 59, 64, 68, 70, 74, 79, 83, 85, 88, 93, 94.

12. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This claim contain the phrase "preferably", which renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). All dependent claims inherit this defect, therefore, the full list of rejected claims is: Claims 3, 6, 15, 24, 33, 39, 42, 47-50, 52, 57, 64, 70, 74, 79, 85.

13. Claims 30, 51, 59, 64, and 91 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly

claim the subject matter which applicant regards as the invention. This claim contains the phrase "the or another", which renders the claim indefinite because the meaning of the phrase is vague. All dependent claims inherit this defect, therefore, the full list of rejected claims is: Claims 30, 51, 59, 64, 70, 74, 79, 85 and 91.

14. The specification regarding the claimed invention is deficient in the areas cited above. Accordingly, the examiner has made prior art rejections based on the scope of information contained in the specification for supporting the claims. The rejections are complete and specifically applied against the claims based on this limited disclosure.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. The prior art used for these rejections is as follows:

17. Bernitsas, U.S. Patent 5,570,321. (Henceforth referred to as "**Bernitsas**").

18. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

19. **Claims 36, 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Bernitsas.**

20. In regards to Claim 36, Bernitsas teaches the following limitations:

36. An automated method of utilizing at least one computer to automatically generate an optimized outcome based on input data, said method comprising the steps of:
A. accessing said input data,
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

providing the input data as input to at least one optimization algorithm,
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

and running said at least one optimization algorithm on said at least one computer to provide a plurality of optimized model outcomes from the said input data;
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

B. automatically applying at least a second algorithm on said at least one computer and thereby automatically choosing one among the optimized outcomes according to predetermined criteria applied by said at least second algorithm; and
(Bernistas, especially: Fig.12 and col.4, lines 39-40; col.9, line 60 to col.10, line 21;)

C. displaying the chosen one optimized outcome on a viewing screen.
(Bernistas, especially: Fig.3c and col.4, lines 13-16)

21. In regards to Claim 46, Bernitsas teaches the following limitations:

46. An automated method of utilizing at least two computing systems automatically generate an optimized outcome based on input data,
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

said method comprising the steps of:
A. accessing said input data,
providing the input data as input to at least one optimization algorithm,
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

and running said at least one optimization algorithm
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

on a first computing system to provide a plurality of optimized model outcomes from the said input data;

(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

B. automatically running at least a second algorithm on said first computing system
(Bernistas, especially: Fig.12 and col.4, lines 39-40; col.9, line 60 to col.10, line 21;)

and thereby automatically choosing one among the optimized outcomes according to predetermined criteria applied by said at least second algorithm; and
(Bernistas, especially: Fig.12 and col.4, lines 39-40; col.9, line 60 to col.10, line 21;)

C. displaying the chosen one optimized outcome on a viewing screen on a second computing system distal from and selectably connected to said first computing system.
(Bernistas, especially: Fig.3c and col.4, lines 13-16)

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

23. The prior art used for these rejections is as follows:

24. Bernitsas, U.S. Patent 5,570,321. (Henceforth referred to as "**Bernitsas**").

25. Busche et al., U.S. Patent 6,430,547. (Henceforth referred to as "**Busche**").

26. Mezzatesta et al., U.S. Patent 5,862,513. (Henceforth referred to as "**Mezzatesta**").

27. Madisetti et al., "Seismic Migration Algorithms on Parallel Computers". IEEE Transactions on Signal Processors, July 1991. (Henceforth referred to as "**Madisetti**").

28. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

29. **Claims 1, 3-7, 19-24, 26-29, 31-35, 37, 41-45, 48-50, 52-58, 61-63, 66-67, 71-89, 92, and 94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernitsas in view of Busche.**

30. In regards to Claim 1, Bernitsas teaches the following limitations:

1. An automated optimization computing system of the type for optimization of models based on input data input into the system,
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

the optimization computing system comprising in combination:
A. a main user interface system having
at least one input data entry screen,
Examiner interprets the claimed limitation "input data entry screen" as being a display of input data. Figures 3a and 5 of Bernitsas show: a display of a CDP record; and sample data from a marine data set. Moreover, Claim 1 of Bernitsas (col.14, line 5) teaches that the data is "displayed".

an optimized model viewing screen,
Examiner interprets the claimed limitation "optimized model viewing screen" as being a display of the optimized model. Figures 3c and 8 of Bernitsas show: the display of Figure 3a after correction for residual NMO; the seismic events of Fig.5 after correction for NMO. Moreover, Claim 1 of Bernitsas (col.14, line 5) teaches that the data is "displayed".

Bernitsas, on the other hand, does not expressly teach that the optimization computing system is distributed among a plurality of "modules" and "facilities", as claimed in the present application.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). More specifically, in regards to the claimed limitations,

a data exporting facility,
and a data importing facility; and
Examiner finds that the interconnected subsystems (See Busche, Fig.4) and network connections between computers (See Busche, Fig.1) inherently require "data exporting facilities" and "data importing facilities", otherwise the communication between subsystems and computers would not work.

B. a separate optimizing subsystem in communication with the main interface system to
accept said input data from the data exporter of the main module,
Examiner finds that exchange of data is inherent between computers connected on a network.

run an optimization algorithm utilizing the accepted input data,
(See Busche, Fig.4, Item 412; and col.13, lines 27-30; and col.14, lines 22-26)
and provide optimized model data to the main user interface system;
(See Busche, Fig.4, Item 412; and col.13, lines 27-30; and col.14, lines 22-26)
whereby the main module system may optionally run on a first computer,
(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)
Examiner interprets the limitation as claiming that the "main module" runs on the first computer.

the optimizing system may optionally run on a second computer distal from the first computer,
(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)
Examiner interprets the limitation as claiming that the "optimizing system" runs on the second computer.

and thereby:
(i) the main user interface system optionally may remotely provide said input data to the optimizing subsystem,
(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)
Examiner interprets the limitation as claiming that the "main user interface system" is a component of the "main module", and provides input data to the "optimizing subsystem". Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another.

(ii) the optimizing subsystem optionally may remotely generate optimized model data utilizing said input data, and
(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)
Examiner interprets the limitation as claiming that the "optimizing subsystem" generates "optimized model data" utilizing the input data. Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another.

(iii) the main user interface system may remotely display an optimized model based on said optimized model data provided by the optimizing subsystem.

(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)
Examiner interprets the limitation as claiming that the "main user interface system" displays an "optimized model data" provided by the "optimizing subsystem". Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

31. In regards to Claim 3, Bernitsas does not expressly teach the following limitations:

3. The automated optimization system of claim 1 also including a model data file exporter, whereby the optimization computing system stores model data in a file with a unique name and preferably does not overwrite other model data files.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). The use of files to store data is inherent to a computer network.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological

samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

32. In regards to Claim 4, Bernitsas does not expressly teach the following limitations:

4. The automated optimization system of claim 1 wherein the main module system includes a graphical user interface providing a plurality of differing views of data including a graphical optimized model screen.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). Busche teaches (Fig.4, Item 414; and col.13, lines 40-42) that "... spatial display subsystem 414 that incorporates the results into various display for human interpretation and viewing."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

33. In regards to Claim 5, Bernitsas teaches the following limitations:

5. The automated optimization system of claim 1 wherein the main user interface system includes

(ii) a re-optimization selector in communication with the optimizing subsystem, whereby the altered and confined optimized model data may be provided to the optimizing subsystem for re-optimization subject to the constraints in the **altered optimized** model data.
(Bernistas, especially: Fig.4, Fig.12, and associated text)

However, Bernistas does not expressly teach the following limitations:

(i) a presenting screen, whereby the user may selectively alter optimized model data; and

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). Busche teaches (Fig.4, Item 414; and col.13, lines 40-42) that "... spatial display subsystem 414 that incorporates the results into various display for human interpretation and viewing."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

34. In regards to Claim 6, Bernitsas does not expressly teach the following limitations:

6. The automated optimization system of claim 3 wherein the main user interface system includes
(ii) a re-optimization selector in communication with the optimizing subsystem, whereby the altered optimized model data may be provided to the optimizing subsystem for re-optimization subject to the constraints in the **altered and confined optimized** model data.
(Bernistas, especially: Fig.4, Fig.12, and associated text)

However, Bernistas does not expressly teach the following limitations:

(i) a presenting screen, whereby the user may selectively altered optimized model data; and

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). Busche teaches (Fig.4, Item 414; and col.13, lines 40-42) that "... spatial display subsystem 414 that incorporates the results into various display for human interpretation and viewing."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

35. In regards to Claim 7, Bernitsas does not expressly teach the following limitations:

7. The automated optimization system of claim 4 wherein the main user interface system includes
(ii) a re-optimization selector in communication with the optimizing subsystem, whereby the altered input data may be provided to the optimizing subsystem for re-optimization subject to the **altered** input data.

However, Bernistas does not expressly teach the following limitations:

(i) a presenting screen, whereby the user may selectively altered optimized model data; and

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). Busche teaches (Fig.4, Item 414; and col.13, lines 40-42) that "... spatial display subsystem 414 that incorporates the results into various display for human interpretation and viewing."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

36. In regards to Claim 19, Bernitsas teaches the following limitations:

19. The automated optimization system of claim 1 wherein the input data is seismic data and the optimized model data is seismic optimized model data.
(See Bernitsas, Abstract)

37. Claims 20-24 recite the same limitations as Claim 19, and therefore are rejected on the same grounds.

38. In regards to Claim 26, Bernitsas teaches the following limitations:

26. An automated optimization computing system of the type for optimization of models based on input data input into the system,
the optimization computing system comprising in combination:
A. a first computing system including
a main interface system having at least one input data entry screen,

Examiner interprets the claimed limitation "input data entry screen" as being a display of input data. Figures 3a and 5 of Bernitsas show: a display of a CDP

record; and sample data from a marine data set. Moreover, Claim 1 of Bernitsas (col.14, line 5) teaches that the data is "displayed".

an optimized model viewing screen,

Examiner interprets the claimed limitation "optimized model viewing screen" as being a display of the optimized model. Figures 3c and 8 of Bernitsas show: the display of Figure 3a after correction for residual NMO; the seismic events of Fig.5 after correction for NMO. Moreover, Claim 1 of Bernitsas (col.14, line 5) teaches that the data is "displayed".

Bernitsas, on the other hand, does not expressly teach that the optimization computing system is distributed among a plurality of "modules" and "facilities", as claimed in the present application.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). More specifically, in regards to the claimed limitations,

a data exporting facility,
and a data importing facility; and

Examiner finds that the interconnected subsystems (See Busche, Fig.4) and network connections between computers (See Busche, Fig.1) inherently require "data exporting facilities" and "data importing facilities", otherwise the communication between subsystems and computers would not work.

B. a second computing system distal from and selectably connected to said first computing system, said second computing system including a separate optimizing subsystem in communication with the main interface system to accept said input data from the data exporter of the main module,
Examiner finds that exchange of data is inherent between computers connected on a network.

run an optimization algorithm utilizing the accepted input data,
(See Busche, Fig.4, Item 412; and col.13, lines 27-30; and col.14, lines 22-26)

and provide optimized model data to the main interface system;
(See Busche, Fig.4, Item 412; and col.13, lines 27-30; and col.14, lines 22-26)

whereby the main interface system may optionally run on a first computer,
(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)

Examiner interprets the limitation as claiming that the "main module" runs on the first computer.

the optimizing system may optionally run on a second computer distal from the first computer,
(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)

Examiner interprets the limitation as claiming that the "optimizing system" runs on the second computer.

and thereby:
(i) the main module optionally may remotely provide said input data to the optimizing subsystem,
(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)

Examiner interprets the limitation as claiming that the "main user interface system" is a component of the "main module", and provides input data to the "optimizing subsystem". Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another.

(ii) the optimizing subsystem optionally may remotely generate optimized model data utilizing said input data, and
(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)

Examiner interprets the limitation as claiming that the "optimizing subsystem" generates "optimized model data" utilizing the input data. Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another.

(iii) the main interface system may remotely display an optimized model based on said optimized model data provided by the optimizing subsystem.
(See Busche, Figs.1 and 4; and col.2, line 59 to col.3, line 27)

Examiner interprets the limitation as claiming that the "main user interface system" displays an "optimized model data" provided by the "optimizing subsystem". Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data

analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

39. In regards to Claim 27, Bernitsas does not expressly teach the following limitations:

27. The automated optimization computing system of claim 22 wherein the selectable connection between the first computing system and the second computing system includes an Internet link.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1).

Moreover, Busche's Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another. Reference is made to the internet in col.3, lines 12-26.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

40. Claims 48, 61 and 89 recite the same limitations as Claim 27, and therefore are rejected on the same grounds.

41. In regards to Claim 28, Bernitsas does not expressly teach the following limitations:

28. The automated computing system of claim 22 wherein the selectable connection between the first computing system and the second computing system includes a wireless link.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1).

Moreover, Busche's Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another. Reference is made to "temporary connections made through telephone connections." (See col.3, lines 1-3). Examiner interprets this as including wireless connections.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

42. Claim 49 and 62 recites the same limitations verbatim as Claim 28, and therefore are rejected on the same grounds.

43. In regards to Claim 29, Bernitsas does not expressly teach the following limitations:

29. The automated computing system of claim 22 wherein the selectable connection between the first computing system and the second computing system includes an intranet link.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1).

Moreover, Busche's Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another. Reference is made to the internet in col.3, lines 12-26.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

44. Claims 50 and 63 recites the same limitations verbatim as Claim 29, and therefore are rejected on the same grounds.

45. In regards to Claim 31, Bernitsas teaches the following limitations:

31. The automated computing system of claim 22 wherein the input data comprises seismic data and the optimized model data comprises optimized seismic model data.
(See Bernitsas, Abstract)

46. Claims 32-35 recite the same limitations verbatim as Claim 31, and therefore are rejected on the same grounds.

47. Claims 52-57 recite the same limitations as Claim 31, and therefore are rejected on the same grounds.

48. In regards to Claim 37, Bernitsas teaches the following limitations:

> 37. The automated optimization method of claim 32 wherein the second algorithm comprises choosing the one among the optimized outcomes that presents the most globally optimized result.

49. In regards to Claim 41, Bernitsas does not expressly that the optimization algorithm takes place on one computer, while the results are displayed on a different computer, as claimed in the present application:

> 41. The automated optimization method of claim 32 wherein: step A includes running said at least one optimization algorithm on at least a first computer; and step C includes transmitting at least a substantial portion of said optimized outcome to a second computer distal from and in communication with said first computer to thereby display said substantial portion of said optimized outcome on a screen associated with said second computer.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1).

Moreover, Busche's Figures 1 and 4 show that all of the components and computers are interconnected and communicate with one another. In addition, Busche's Fig 1 shows computers with video monitors, and Fig.2 shows a Graphics Adapter (Item 218) and an Audio/Video Adapter (Item 219). (See also col.3, lines 44-46).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche,

because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

50. Claims 42-45 and 71-75 recite the same limitations verbatim as Claim 41, and therefore are rejected on the same grounds.

51. In regards to Claim 58, Bernitsas teaches the following limitations:

58. A method of generating an optimized model of a physical system based on empirical input data, the method comprising the steps of:
A. acquiring the empirical input data by recording physical characteristics of the physical system in the field;
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

C. utilizing the empirical input data as input to an optimization algorithm running on a computer and thereby generating the optimized model of the physical system;
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

D. displaying the optimized model on a viewing screen;
(Bernistas, especially: Fig.3c and col.4, lines 13-16)

F. providing the altered elements as constraint input to the or another optimization algorithm and thereby generating a constrained optimized model of the physical system; and
(Bernistas, especially: Fig.12 and col.4, lines 39-40; col.9, line 60 to col.10, line 21;)

Bernitsas, however, does not expressly teach the remaining limitations. Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems"

(See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). More specifically, in regards to the claimed limitations,

B. recording the empirical input data in a computer memory;
(See Busche, Fig.2, Items 204 and 224; col.3, lines 27-50)

E. altering aspects of the optimized model on said viewing screen; and
(See Fig.4, Item 414 – "Spatial Display Subsystem", which interacts with Items 412 and 414, "Spatial Analysis Subsystem" and "Data Mining Subsystem". See also col.13, lines 31-43)

G. displaying the constrained optimized model on the or another viewing screen.
(See Busche, Fig.1, Items 108, 110, 112; and col.3, lines 4-27. See also col.13, lines 31-43)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

52. In regards to Claim 66, Bernitsas teaches the following limitations:

66. The automated method of claim 61 wherein the number of optimized outcomes to be averaged is determined automatically based on the number of iterations run by the optimization algorithm to generate a single optimized model outcome among the plurality of outcomes.
(Bernitsas, Fig.12 and associated text)

53. In regards to Claim 67, Bernitsas teaches the following limitations:

67. The automated method of claim 61 wherein (i) the method also includes the steps of re-running said at least one optimization algorithm and re-averaging the plurality of model outcomes to generate a plurality of averaged optimized model outcomes, and then applying a second algorithm to select the one among the plurality of averaged optimized model outcomes that presents the most globally optimized result; and

(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

(ii) the displaying step displays the most globally optimized result on said viewing screen.
(Bernistas, especially: Fig.3c and col.4, lines 13-16)

54. In regards to Claim 76, Bernitsas teaches the following limitations:

76. The automated method of claim 61 wherein the input data comprises seismic data acquired from empirical testing in a geographical region and each optimized model outcome comprises an optimized model of seismic characteristics of said region.
(See Bernitsas, Abstract)

55. Claims 77-86 recite the same limitations verbatim as Claim 76, and therefore are rejected on the same grounds.

56. In regards to Claim 87, Bernitsas teaches the following limitations:

87. An automated optimization computing system of the type for optimization of models based on input data input into the system, the optimization computing system comprising in combination:
A. an optimizing system loadable onto a first computing system having an optimization algorithm providing optimized model data based on input data provided to the optimizing system;
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

Bernitsas, however, does not expressly teach the remaining limitations. Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). More specifically, in regards to the claimed limitations,

B. an automatic data transfer system loadable on a second computer distal from the optimizing system and in communication with the optimizing system;
whereby:
(i) the automatic data transfer system remotely provides said input data to the optimizing system,
(See Busche, Figs.1,4 and associated text)

(ii) the optimizing system remotely generates optimized model data utilizing said input data, and

Examiner interprets the limitation as claiming that the "optimizing subsystem" generates "optimized model data" utilizing the input data.
(See Busche, Figs.1,4 and associated text)

(iii) the automatic data transfer system may remotely display an optimized model based on said optimized model data provided by the optimizing system.

Examiner interprets the limitation as claiming that the "automatic data transfer system" displays an "optimized model data" provided by the "optimizing subsystem".
(See Busche, Figs.1,4 and associated text)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

57. In regards to Claim 88, Bernitsas does not expressly teaches the following limitations:

88. The automated optimization computing system of claim 83 wherein the automatic data transfer system includes a Internet web browser compatible interface.

Busche, on the other hand, does expressly teach these limitations. (See Fig.1, Items 100 and 102; and col.3, lines 12-26;)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological

samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

58. In regards to Claim 90, Bernitsas teaches the following limitations:

90. A method of generating an optimized model of a seismic field based on empirical seismic data collected from a geophone array in the seismic field, the method comprising the steps of:
B. utilizing the empirical input data as input to an optimization algorithm running on an optimizing computer and thereby generating the optimized model of the physical system;
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

C. displaying the optimized model on a viewing screen;
(Bernistas, especially: Fig.3c and col.4, lines 13-16)

Bernitsas, however, does not expressly teach the use of a computer, nor the remaining limitations.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). More specifically, in regards to the claimed limitations,

A. recording the empirical input data in a computer memory,
(See Busche, Fig.2, Items 204 and 224; col.3, lines 27-50)

D. altering aspects of the optimized model on said viewing screen; and providing the altered elements as constraint input to the or another optimization algorithm and thereby generating a constrained optimized model of the physical system; and
(See Fig.4, Item 414 – "Spatial Display Subsystem", which interacts with Items 412 and 414, "Spatial Analysis Subsystem" and "Data Mining Subsystem". See also col.13, lines 31-43)

F. displaying the constrained optimized model on the or another viewing screen.
(See Busche, Fig.1, Items 108, 110, 112; and col.3, lines 4-27. See also col.13, lines 31-43)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

59. In regards to Claim 91, Bernitsas does not expressly teaches the following limitations:

91. The method of claim 86 wherein recording step also includes accessing the optimizing computer remotely and automatically transferring the recorded empirical input data to the optimizing computer.

Busche, on the other hand, does expressly teach these limitations. (See Fig.1, Items 100 and 102; and col.3, lines 12-26;)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

60. In regards to Claim 92, Bernitsas teaches the following limitations:

92. A method of providing optimization services to a remote user having a remote computing system, the method including the steps of:
A. providing an optimization computing system having an optimizing system

including an optimization algorithm;
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

D. utilizing the input data and generating an optimized model with the optimizing system on the optimization computing system; and
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

Bernitsas, however, does not expressly teach the use of a computer, nor the remaining limitations.

Busche, on the other hand, expressly teaches a method that integrates spatial analysis and data mining for geological data that uses a plurality of "subsystems" (See Busche, Fig.4) and a plurality of computers on a network (See Busche, Fig.1). More specifically, in regards to the claimed limitations,

B. providing the remote user with remote access to the optimization computing system;
(See Busche, Fig.1, Items 108, 110, 112; and col.3, lines 4-27. See also col.13, lines 31-43)

C. accepting input data from the remote user at the optimization computing system through a communication link between the remote user and optimization computing system;
(See Fig.4, Item 414 – "Spatial Display Subsystem", which interacts with Items 412 and 414, "Spatial Analysis Subsystem" and "Data Mining Subsystem". See also col.13, lines 31-43)

E. providing the remote user with access to information regarding the optimized model.
(See Busche, Fig.1, Items 108, 110, 112; and col.3, lines 4-27. See also col.13, lines 31-43)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological

samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14)

61. In regards to Claim 94, Bernitsas teaches the following limitations:

94. The optimization service method of claim 88 wherein the communication link includes the Internet and the remote user transfers input data to the optimization computing system through at least a portion of a web browser running on a remote user computing system.

Busche, on the other hand, does expressly teach these limitations. (See Fig.1, Items 100 and 102; and col.3, lines 12-26;)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Busche, because "... it would be advantageous to provide a method and system for data analysis that discovers these relationships in the data between geological samples collected in the field and other data gathered during geophysical and geochemical surveying or remote sensing of the region from which the samples were collected." (Busche, col.2, lines 7-14).

62. Claims 8-18, 25, 30, 38, 47, 51, 59, 64-65, and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernitsas in view of Busche and further in view of Madisetti.

63. In regards to Claim 8, Bernitsas does not expressly teach the following limitations:

8. The automated optimization system of claim 1 also including an optimization run-time estimator display, whereby an estimate of the run-time for an optimization of said input data by said optimizing subsystem can be displayed.

Madisetti, on the other hand, teaches the display of the run time of seismic signal processing on parallel computers. (See p.1649, Fig.4 and Fig.5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Madisetti with those of Bernitsas, because "... seismic signal processing is computationally intensive and sequential algorithms in use do not exploit the concurrency inherent in data migration techniques." (Madisetti, Abstract).

64. In regards to Claim 9, Bernitsas does not expressly teach the following limitations:

9. The automated optimization system of claim 1 also including a sampling plot display, whereby the effectiveness of the sampling technique for procuring said input data can be displayed.

Madisetti, on the other hand, teaches the display of the effectiveness of seismic signal processing on parallel computers. (See p.1649, Fig.4 and Fig.5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Madisetti with those of Bernitsas, because "... seismic signal processing is computationally intensive and sequential algorithms in use do not exploit the concurrency inherent in data migration techniques." (Madisetti, Abstract).

65. In regards to Claim 10, Bernitsas does not expressly teach the following limitations:

10. The automated optimization system of claim 1 wherein the said optimization subsystem includes a parallelizable optimizing algorithm, whereby the optimizing algorithm may run in parallel on multiple computer processors.

Madisetti, on the other hand, teaches seismic signal processing on parallel computers.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Madisetti with those of Bernitsas, because "... seismic signal processing is computationally intensive and sequential algorithms in use do not exploit the concurrency inherent in data migration techniques." (Madisetti, Abstract).

66. Claims 11-18, 25, 30, 38, 47, 51, 59, 64, and 68 recite the same limitations verbatim as Claim 10, and therefore are rejected on the same grounds.

67. In regards to Claim 65, Bernitsas teaches the following limitations:

65. An automated method of utilizing at least one computer to automatically generate an optimized outcome based on input data, said method comprising the steps of:
A. Accessing said input data, providing the input data as input to at least one optimization algorithm, and running said at least one optimization algorithm on said at least one computer to provide a plurality of optimized model outcomes from the said input data;
(Bernistas, especially: Fig.4 and col.4, lines 13-16; and col.5, line 62 to col.6, line 26; and col.7, lines 13-17; and col.11, lines 35-50; and col.13, lines 43-50)

C. displaying the averaged optimized model outcome on a viewing screen.
(Bernistas, especially: Fig.3c and col.4, lines 13-16)

Bernitsas, however, does not expressly teach the following limitations:

B. averaging the plurality of optimized model outcomes to provide an averaged optimized model outcome; and

Madisetti, on the other hand, teaches averaging the seismic signal processing on parallel computers. (See p.1649, Fig.4 and Fig.5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Madisetti with those of Bernitsas, because "... seismic signal processing is computationally intensive and

sequential algorithms in use do not exploit the concurrency inherent in data migration techniques." (Madisetti, Abstract).

68. **Claims 39, 40, 69, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernitsas in view of Busche and further in view of Mezzatesta.**

69. In regards to Claim 39, Bernitsas teaches the use of an optimization algorithm (See Abstract), and teaches the flowchart of an annealing process (See Fig.12 and col.4, lines 39-41), however, Bernitsas does not expressly teach "genetic algorithm" claimed in the following limitations:

39. The automated optimization method of claim 33 wherein said at least one algorithm comprises a genetic optimization algorithm.

Mezzatesta, on the other hand, recites that the prior teaches that genetic algorithms are used in reannealing algorithms (See col.1, lines 52-56).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Bernitsas with those of Mezzatesta, because Mezzatesta taught the state of the prior art.

70. Claims 40, 69, and 70 recite the same limitations verbatim as Claim 39, and therefore are rejected on the same grounds.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is

(703) 306-0297. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on (703) 305-9704. Any response to this office action should be mailed to:

Director of Patents and Trademarks
Washington, DC 20231

Hand-delivered responses should be brought to the following office:

4th floor receptionist's office
Crystal Park 2
2121 Crystal Drive
Arlington, VA 22202

The fax phone number is: (703) 872-9306

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is: (703) 305-3900.

Ayal I. Sharon

Art Unit 2123

July 9, 2004

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER